

CLAIMS

What is claimed is:

1. A gas exhausting apparatus for use in a wet electrophotographic image forming device, the apparatus comprising:
 - an exhaust duct forming an air flow passage from an inside of a wet electrophotographic image forming device to an outside of the device;
 - an exhaust fan inhaling air from the inside of the device through the exhaust duct and exhausting the air through the exhaust duct to the outside of the device; and
 - an air purification unit that removes impurities included in the air inhaled by the exhaust fan through the exhaust duct; and,wherein the exhaust duct includes:
 - a first inhalation guide formed to inhale and guide impurity-containing high temperature air in the device and having the air purification unit disposed therein to pass the impurity-containing air through the air purification unit;
 - a second inhalation guide formed to inhale and guide non-impurity-containing air of room temperature in the device; and
 - an exhaust guide formed to communicate with the first inhalation guide and the second inhalation guide and having the exhaust fan disposed therein to mix the impurity-containing air and the non-impurity-containing air respectively inhaled through the first inhalation guide and the second inhalation guide and then exhaust the impurity-containing air and the non-impurity-containing air to the outside of the device.
2. The apparatus according to claim 1, wherein the first inhalation guide comprises an inlet disposed proximate to a pressing roller and a heating roller of a fusing unit to inhale the impurity-containing air including a hydrocarbon gas generated due to evaporation of a carrier solution of liquid toner during a fusing operation.
3. The apparatus according to claim 1, wherein the air purification unit further comprises a combustion part to remove impurities from air passing therethrough by thermally decomposing and oxidizing the impurities by heating and catalyst-oxidizing the air.

4. The apparatus according to claim 3, wherein the combustion part of the air purification unit comprises a heater that generates heat by an electric power.
5. The apparatus according to claim 4, wherein the air purification unit further comprises an oxidation catalyst part disposed proximate to the heater to promote oxidation of the impurities.
6. The apparatus according to claim 5, wherein the oxidation catalyst part comprises:
 - a catalyst-carrier body composed of one selected from a gamma alumina, a diatomaceous earth and metallic materials; and
 - a catalyst coated on an outer surface of the catalyst-carrier body and composed of one selected from the group consisting of Pd, Pt, Co_3O_4 , PdO, Cr_2O_3 , Mn_2O_3 , CuO, SeO_2 , FeO_2 , Fe_2O_3 , V_2O_5 , NiO, Ag, MoO_3 and TiO_2 .
7. The apparatus according to claim 6, wherein the catalyst-carrier body comprises a plurality of openings arranged in an air flow direction to widely maintain an area coming in contact with the impurities.
8. The apparatus according to claim 7, wherein the catalyst-carrier body comprises a heater receiving portion receiving and fixing the heater.
9. The apparatus according to claim 1, wherein the exhaust fan is disposed in an exhaust end of the exhaust guide located downstream of the air purification unit.
10. A gas exhausting apparatus, the apparatus comprising:
 - a first inhalation guide which guides impurity-containing high temperature air drawn into the first inhalation guide from within the device;
 - an air purification unit which removes impurities from air passing therethrough, the air purification unit being disposed in the first inhalation guide to remove impurities from the impurity-containing high temperature air drawn into the first inhalation guide;

a second inhalation guide which guides non-impurity-containing air of lower temperature than the impurity-containing high temperature air drawn into the second inhalation guide, the second inhalation guide in communication with the first inhalation guide at a portion downstream of the air purification unit;

an exhaust guide in communication with the first and second inhalation guides; and

an exhaust unit located at an exhaust end of the exhaust guide which draws air into and through the first and second inhalation guides to the exhaust guide, mixes, in at least at portion of the exhaust guide, the air respectively drawn through the first and second inhalation guides, and exhausts the mixture from the exhaust guide to an outside of the exhaust guide by generating a pressure differential between an inside of the exhaust guide and the outside of the exhaust guide.

11. A gas exhausting apparatus for use in a device, the apparatus comprising:

an airflow passage from an inside of the device to an outside of the device, the airflow passage having an exhaust portion, a first branch in communication with the exhaust portion and a second branch in communication with the exhaust portion and the first branch, the first branch having an inlet at an end distal to the second branch, the second branch having an inlet at an end distal to the exhaust portion;

an impurity remover which removes impurities from air, the impurity remover being disposed in the first branch; and

an exhaust unit disposed at an end of the exhaust portion distal to the second branch, the exhaust unit drawing first air from within the device into the first branch, through the impurity remover, and into the exhaust portion and drawing second air from within the device into and through the second branch into the exhaust portion, the exhaust unit mixing the first air and second air in at least a part of the exhaust portion and exhausting the mixture to an outside of the device,

wherein the first air contains impurities and is hot and the second air is room temperature.

12. A method of exhausting gas from an electrophotographic image forming device of the wet type, the method comprising:

drawing a gas and surrounding impurity-containing high temperature air from within a printer into a first inhalation guide;

removing the impurities in the gas and surrounding impurity-containing high temperature air to yield first non-impurity-containing air;

inhaling second non-impurity-containing air from within the device into a second inhalation guide;

drawing the first non-impurity-containing air and the second non-impurity-containing air into an exhaust guide;

mixing the first and second non-impurity-containing airs in at least a portion of the exhaust guide; and

exhausting the mixture out of the device to an outside of the device.